CLAIMS

We claim:

1. A method for capturing a digital panoramic image, by projecting a panorama onto an image sensor by means of a panoramic objective lens, the panoramic objective lens having an image point distribution function that is not linear relative to the field angle of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that the panoramic image obtained has at least one substantially expanded zone and at least one substantially compressed zone.

2. The method according to claim 1, wherein the objective lens has a non-linear distribution function that is symmetrical relative to the optical axis of the objective lens, the position of an image point relative to the center of the image varying according to the field angle of the corresponding object point.

3. The method according to claim 1, wherein the objective lens expands the center of the image and compresses the edges of the image.

4. The method according to claim 1, wherein the objective lens expands the edges of the image and compresses the center of the image.

5. The method according to claim 1, wherein the objective lens compresses the center of the image and the edges of the image and expands an intermediate zone of the image located between the center and the edges of the image.

6. The method according to claim 1, wherein the objective lens comprises a set of lenses forming an apodizer.

7. The method according to claim 6, wherein the set of lenses forming an apodizer comprises at least one aspherical lens.

8. The method according to claim 6, wherein the set of lenses forming an apodizer comprises at least one diffractive lens.

9. The method according to claim 1, wherein the objective lens comprises a set of mirrors including at least one distorting mirror.

10. A method for displaying an initial panoramic image obtained in accordance with the method according to claim 1, the method for displaying comprising:

correcting the non-linearity of the initial image, performed by means of a reciprocal function of the non-linear distribution function of the objective lens or by means of the non-linear distribution function.

11. The method according to claim 10, wherein the step of correcting comprises a step of transforming the initial image into a corrected digital image comprising a number of image points higher than the number of pixels that the image sensor comprises.

12. The method according to claim 11, further comprising:

calculating the size of the corrected image, by means of the reciprocal function of the distribution function, so that the resolution of the corrected image is equivalent to the most expanded zone of the initial image, and

scanning each image point of the corrected image, searching for the position of a twin point of the image point on the initial image and allocating the color of the twin point to the image point of the corrected image.

13. The method according to claim 11, wherein the initial image and the corrected image comprise an image disk.

14. The method according to claim 11, further comprising:

transferring the image points of the corrected image into a three-dimensional space, and

presenting one sector of the three-dimensional image obtained on a display means.

15. The method according to claim 10, further comprising:

determining the color of image points of a display window, by projecting the image points of the display window onto the initial image by means of the non-linear distribution function, and

allocating to each image point of the display window the color of an image point that is the closest on the initial image.

16. The method according to claim 15, wherein the projection of the image points of the display window onto the initial image comprises:

projecting the image points of the display window onto a sphere or a sphere portion,

determining the angle in relation to the center of the sphere or the sphere portion of each projected image point, and

projecting onto the initial image each image point projected onto the sphere or the sphere portion, the projection being performed by means of the non-linear distribution function considering the field angle that each point to be projected has in relation to the center of the sphere or the sphere portion.

17. A panoramic objective lens comprising:

optical means for projecting a panorama into an image plane of the objective lens, the optical means having an image point distribution function that is not linear relative to the field angle

of object points of the panorama, the distribution function having a maximum divergence of at least ±10% compared to a linear distribution function, such that a panoramic image obtained by means of the objective lens comprises at least one substantially expanded zone and at least one substantially compressed zone.

18. The panoramic objective lens according to claim 17, having a non-linear distribution function that is symmetrical relative to the optical axis of the objective lens, the position of an image point relative to the center of an image obtained varying according to the field angle of the corresponding object point.

19. The panoramic objective lens according to claim 17, wherein the lens expands the center of an image and compresses the edges of the image.

20. The panoramic objective lens according to claim 17, wherein the lens expands the edges of an image and compresses the center of the image.

21. The panoramic objective lens according to claim 17, wherein the lens compresses the center of the image and the edges of the image, and expands an intermediate zone of the image located between the center and the edges of the image.

22. The panoramic objective lens according to claim 17, further comprising a set of lenses forming an apodizer.

23. The panoramic objective lens according to claim 22, wherein the set of lenses forming an apodizer comprises at least one aspherical lens.

24. The panoramic objective lens according to claim 22, wherein the set of lenses forming an apodizer comprises at least one diffractive lens.

25. The panoramic objective lens according to claim 22, comprising polymethacrylate lenses.

26. The panoramic objective lens according to claim 17, comprising a set of mirrors comprising at least one distorting mirror.